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(71) Applicant
Franco Donadelli,
Bronzino, 6 Milano, Italy
(72) Inventor
Franco Donadelli
(74) Agents
J. F. Williams & Co.,
23 Tavistock Street,
London WC2E 7PB

(54) **Treating compositions with alternating electric currents**

(57) A preparation for electrical stimulation of the metabolic processes of epithelia by surface application of an aqueous solution comprises extracts of animal tissues treated with low frequency alternating electric currents to produce proteic groupings which are electrically excited within the solution.

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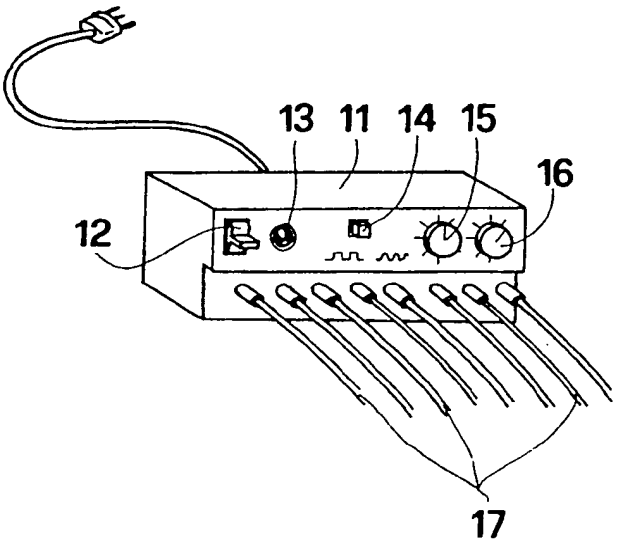

FIG.1

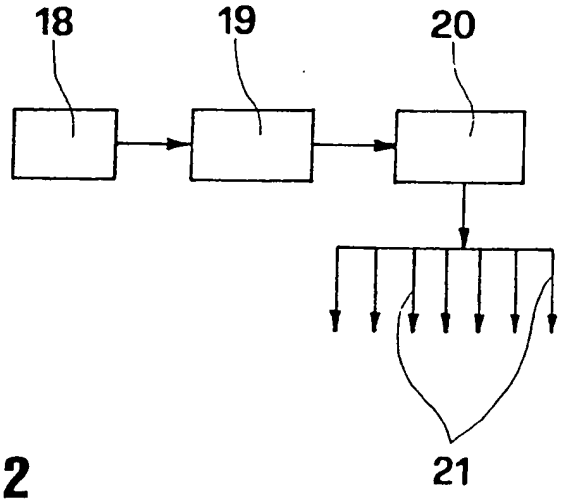

FIG.2

SPECIFICATION

Preparation for electrical stimulation of the epithelia by surface application of an aqueous solution

This invention relates to a preparation for electrical stimulation of the epithelia by surface application of an aqueous solution. The various methods employed for nourishing, regenerating or revitalizing the skin, based on the biochemical action of certain preparations, are well known. Use is made, for example, of preparations having a basis of collagen, placenta extracts, vitamins and other substrates.

Some results have been achieved in moisturing, stimulating and oxygenising the skin, and in improving its respiration, but in actual fact no result has hitherto been obtained in regeneration and similar changes.

In making this original use of known biophysical phenomana, the invention here described does effectively improve cellular metabolism as will be explained here below.

It is known that, when resting, in a semisolid state, the cell presents a degree of internal cohesion such as prevents it from being mobile and from multiplying.

To enable it to multiply, this cohesion must be destroyed thus determining protect sytheses in which S-S disulphide links become S-H sulphydril active links in the sulphurized proteic molecules.

In order to transform the S-S links, which have energy roughly equivalent to 63 Kcal/mol, into S-H links which reach about 87 Kcal/mol, enough energy must be supplied to make up the difference, e.g. between 63 and 87 Kcal/mol.

It is also known that in a solution of groups of aminoacids of polypeptides and electric or magnetic field sets up rectilinear "aggregates" or polymerized molecules lying in the direction of the electric field and provoking an increase in their electric moment.

According to the invention, there is provided a preparation for electrical stimulation of the metabolic processes of the epithelia by surface application of an aqueous solution wherein the preparation comprising a solution of extracts of animal tissues previously subjected to the action of a low-frequency alternating electric current to bring about proteic groupings which are electrically excited within the solution.

Thus skin regeneration is to be achieved by applying an electric field to provide the energy needed for transformation of S-S links into S-H links.

The electric field is created by means of an aqueous solution of extracts of animal tissues; the solution is first subjected to an electrical treatment and then applied to the surface of the skin or mucous.

The solution is aqueous as this will not assist penetration inside the skin.

Using low-frequency alternating current the electrical treatment is carried out in two successive stages:

– the first is given with square waves and gives rise to partial electrolysis thus splitting up the proteins into polypeptides or groups of aminoacids; in this way the groups themselves, and therefore the aminoacids, are not split up.

– the second is given with sinusoidal waves to create the so-called "clusters", namely the grouping of rectilinear molecules, and also to excite them electrically (ionization) by an increase in the electric moment of the molecules themselves.

The extracts of animal tissue are preferably those most suitable for the formation of "proteic groupings" the dimensions of which are as close as possible to those of epithelium proteic groupings such as: extract of placenta, of embryo, of collagen, of vitreous humor, of muscle, of heart muscle, total extract of skin, of bovine foetus, of ovaries, of connective tissues, of the mammary glands, of liver or of the brain. To the tissue extracts addition may be made of aminoacids, preferably of methionine, glycine, cystein, tryptophan, leucine, isoleucine, linear and cyclic aminoacids from C_2 to C_{16}.

Vitamins such as A, C, D, E, H, K and catalysers such as ions or zinc, magnesium, cobalt and other metals may be added.

In a preferred form of execution, the square wave of sinusoidal wave electric fields are applied to the solution for periods of time of about five days each.

A factor of decisive importance in determining the effectiveness of the product is the sizing of the "proteic groupings" as the greater the number of proteic groupings in the solution that "corresponds" to the proteic groupings of the epithelium, the greater will be the transmission of electrical energy from the components of the solution to the molecules of the epithelia.

The energy thus supplied to the molecules makes possible the change from S-S groups to S-H groups breaking molecule cohesion and activating protect synthesis.

The results obtained by experiments on skin affected by acne, dry or asphyxiated skin, on unhealthy skin conditions or where there has been debilitation due to dust, dirt and fog, extremes of temperature, U.V.R. action etc. have confirmed the theoretical assumptions described above. Contrary to the effects secured by other treatments, in addition to better nourishment and protections, undeniable stimulation of proteic synthesis and cell proliferation have been noted clearly indicating a process of skin regeneration.

Beneficial effects have also been obtained on the scalp including stimulation of the roots and growth of new hair, on gum mucous and on female genital organs.

All this has been achieved by means of a "modus operandi" entirely different from that used in application of any other preparation. Not the slightest use is in fact made of the molecules in the substances for their cosmetic or pharmalogical properties, but only the electric charge that such substances possess.

An example of realization of the invention is given below.

An aqueous solution was prepared containing about 5% of extracts of animal tissues composed as follows:

Each liter of solution contained:

15 g of chicken embryo extract
2 g of bovine heart muscle extract
1 g of freeze-dried bovine placenta extract
10 g of bovine collagen in an aqueous solution at 4%
5 g of glycine
8 g of methionine
5 g of sodium glycero-phosphate
1 g of vitamin C
3 g of vitamin E
Anti-fermentation agents and preservatives

Thus prepared, the solution was subjected for five days to a low-frequency, square-wave alternating electrical field.

The electrical field was created by an electromagnetic generator connected to the solution by two gold electrodes. The interval between one wave and the next were so regulated as to cause splitting of the proteins to the sage of formation of polypeptides.

Having terminated the first stage, a simusoidal-wave alternating electrical field was applied for another five days to cause the molecules to form groups and to become electrically excited.

During each of the two stages, electrical current was applied at increasingly higher frequencies, starting from about 100 Hz and reaching approximately 10,000 Hz.

The drawings show an example of an apparatus suitable for generating the electric field:—

Fig. 1 is a perspective view of the outside of the apparatus, and

Fig. 2 is an electrical block diagram of the apparatus.

To generate these electrical fields, use was made of an apparatus like that shown in Fig. 1 placed in its container 11, provided with a switch 12 and a plug for plugging into the electric mains, and with a pilot lamp 13.

A push button 14 can be seen which is used for changing over from a square wave field to a sinusoidal wave field. Knobs 15 and 16 are used for adjusting frequency and voltage respectively.

Output wires 17 are connected to the various pairs of electrodes placed in the vessels containing the solution. In the block diagram of Fig. 2 a transformer 18 can be seen connected to the mains which feeds a sinusoidal and square wave generator 19. From there the signal passes to a signal attenuator 20 from where it reaches pairs of output wires 21.

The solution thus treated was applied with a light massaging movement to the face regularly morning and evening. Right from the first day the skin looked healthier and better nourished, while a few days later improvement was even more evident with clear signs of revitalization.

CLAIMS

1. A preparation for electrical stimulation of the metabolic processes of the epithelia by surface application of an aqueous solution wherein the pre-frequency alternating electric current, to bring about proteic groupings which are electrically excited within the solution.

2. A preparation as claimed in Claim 1, wherein the electric current is applied in two stages; in a first stage square waves are applied in order to produce partial electrolysis which splits the proteins into : polypeptides, and in a second stage sinusoidal waves are generated in order to produce rectilinear grouping of the molecules and to electrically excite them.

3. A preparation as claimed in Claim 1 or 2, wherein the solution contains substances which are suitable for obtaining proteic groupings of more or less the same size as those of the epithelia.

4. A preparation as claimed in Claim 3, wherein the solution contains extracts of one or more of placenta, embryo, collagen, vitreous humor, muscle, heart muscle, total skin extract, bovine foetus, ovary extract, connective tissue, mammary gland, liver, brain or other similar and equivalent substances.

5. A preparation as claimed in any one of claims 1 to 4, wherein one or more of the acids, methionine, glycine, cysteine, tryptophan leucine, isoleucine, and linear and cyclical aminoacids from C_2 to C_{16} are added to the extracts of animal tissues.

6. A preparation as claimed in any one of claims 1 to 5, wherein one or more of vitamins A, C, D, E, H and K, and of "metal" catalysts: ions of zinc, magnesium, cobalt and others are added to the extracts of animal tissues.

7. A preparation as claimed in any one of Claims 1 to 6, wherein the electric current is applied to the solution during each of the two phases for a period of five days, at frequencies progressively rising from 100 Hz to about 10,000 Hz, the variations being both continuous and step-wise.

8. A preparation as claimed in any one of Claims 1 to 7, wherein the apparatus used for applying electro-chemical treatment to the solution comprises an electronic circuit which, by means of the electrodes placed in the solution, sets up first a square-wave electric field, namely with pulses, and then a sinusoidal-wave electric field, for predetermining periods of time, the values of which are preselected and regulatable beforehand in accordance with a desired cycle.

9. A preparation as claimed in Claim 8, wherein the cycle of the apparatus is fully automatic.

10. A preparation for electrical stimulation of the metabolic processes of epithelia by surface application of an aqueous solution as claimed in Claim 1 and substantially as described herein.

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